NEW
BOTANICA
GARDEN

SEVEN NEW GENERA OF THYSANOPTERA FROM AUSTRALIA AND NEW ZEALAND

By Dudley Moulton
Redwood City, California

This paper includes the description of six new genera of Thysanoptera from Australia and one new genus from New Zealand. They include unique forms as evidenced by the development of the head in *Emprosthiothrips* and the shape of the tube in *Adrothrips* and *Dunatothrips*. The specimens were received years ago but it has not been possible to give them proper attention until the present time. I wish to express my thanks to the men far away in Australia who collected and forwarded this material to me. All types in author's collection.

Superfamily PHLAEOTHRIPOIDEA Hood, 1915.
Family PHLAEOTHRIPIDAE Uzel, 1895.
Subfamily PHLAEOTHRIPINAE Karny, 1921.
Tribe HOPLOTHRIPINI Priesner, 1927.

Sunaitiothrips, new genus.

(Sunaitios—accessory, referring to the accessory spine on posterior angle of prothorax.)

Genotype: *S. fuscus*, new species.

Description of Genus: Head 1.7 longer than wide, cheeks almost straight, parallel, distinctly roughened, with a slight collar-like thickening at base; vertex flattened, dorsum with weak transverse lineation; a pair of small setae behind posterior ocelli, two pairs of postoculars placed well back from eyes, the outer pair near sides of head, the inner placed somewhat back of the others. Eyes large, oval, slightly protruding at sides; ocelli large, anterior ocellus directed forwards, posterior pair bordering anterior inner margins of eyes. Antenna 1.7 longer than head, 8-segmented, all distinctly separated, 3 and 4 broadly clavate, 3 with one sensecone, 4 with three sensecones; 8 broadly joined to 7. Mouthcone rounded, reaching three-fourths across prosternum, labrum pointed.

Prothorax only moderately enlarged, without markings, sutures complete; antero-marginal setae reduced, other long, with blunt tips, the accessory seta between each pair on posterior angles also well developed though varying in length. Fore femora greatly enlarged and fore tarsus armed with a long, curved tooth in both sexes. Wings broad, of even width, without venation, fore pair with double fringe hairs, these separated and matched with alternate fringes. Abdomen normal; tube .6 as long as head and slightly more than twice longer than width at base, with straight sides.

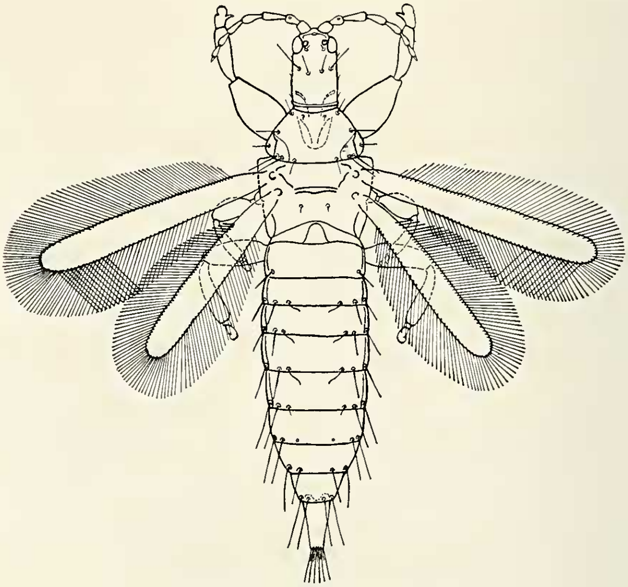
This genus is near *Megeugynothrips* Priesner but separated by more clavate antennal segments three and four, the development of the accessory spines on posterior angles of pronotum, the presence of double fringe hairs on fore wings and the shorter and heavier tube. In *Tetrachaetothrips* Bagnall, also with two pairs of postoculars, antennal segments three to five are narrower in basal half and swollen distally, accessory spines on pronotum are not specially developed and the tube is longer and narrower.

SUNAITIOTHRIPS FUSCUS Moulton, new species.

(Plate 1)

Holotype female: Color brown with last abdominal segments nearly black, legs brown with fore tibiae and tarsi yellowish; antennal segments 1, 7 and 8 dark brown, 2 to 6 mostly yellow but darkened distally; wings clear, slightly washed with brown in the middle, setae clear to yellow.

Total body length 2.62 mm.; head length 0.382 mm., width 0.22 mm.; prothorax length 0.19 mm., width including coxae 0.47 mm., without coxae 0.382 mm.; mesothorax width 0.558 mm., tube length 0.22 mm., width at base 0.102 mm. at tip 0.058 mm. Antennal segments length (width) I, 50 (48); II, 66 (40); III, 110 (46); IV, 113 (46); V, 100 (43); VI, 86 (36); VII, 80 (30); VIII, 43, total 660 microns. Length of spines: post-



Sunaitiothrips fuscus Moulton (♂)
Enlarged approxim. x 29.

ocellars 26, outer postoculars 150, inner 133-143; on anterior angles of pronotum 100, midlaterals 133, outer on posterior angles 160, inner 153-166, intermediate accessory spines 73-120, on ninth abdominal segment 176, at tip of tube 147 microns.

This species is especially characterized by the long, parallel-sided head, distinctly roughened cheeks, two pairs of postocular spines, the development of the accessory spines on the posterior angles of the prothorax, the broad clear wings, fore pair with about seventeen double fringe hairs matching other fringes alternately and by the relatively short, stout tube. Abdominal segments three to six each with one pair of sigmoid spines.

Type material: Holotype female, allotype male, and three paratype females taken by Mr. A. M. Lea. (Nos. 3083, 3084, 3085).

Type locality: Cairns District, South Australia.

HEPTATHRIPS, new genus.

(Hepta—seven, referring to the 7-segmented antenna)

Genotype: *H. tonnoiri,* new species.

Head 1.7 longer than wide, flattened in front, cheeks smooth and straight, diverging behind; postoculars long, pointed, placed rather close to inner, posterior angles of eyes, cheek spines minute; eyes moderately large, slightly produced; ocelli small. Antenna 7-segmented, 3 elongate clavate with two sensecones, 4-7 pediculate, the latter without sign of dividing suture. Mouthcone reaching to near posterior margin of prosternum, broadly rounded, labrum pointed.

Prothorax transverse; anterior margin nearly straight and posterior margin only weakly convex, all setae minute except pair at posterior angles, these long, pointed. Fore femora only moderately thickened, fore tarsus armed with a curved tooth, other legs slender. Wings broad, fore pair with a long series of double fringes. Abdomen stout with long, pointed setae only on distal segments and a single pair of sigmoid setae on segments 2 to 7. Tube .86 as long as head, moderately slender, noticeably reduced only in distal fifth.

This genus belongs in the *Cryptothrips* group of the *Hoplothripini* but is clearly defined by its 7-segmented antenna. It approaches *Mathetethrips* Moulton in the shape of the head but this latter genus has an 8-segmented antenna. It appears to be most closely related to *Zaliothrips* Hood but is different in many ways.

HEPTATHRIPS TONNOIRI, new species.

(Plate 2)

Holotype female: Color blackish brown with only fore tibiae and all tarsi lighter; wings washed with brown; prominent spines clear to yellowish.

Total body length 3.5 mm.; head length 0.44 mm., width behind eyes 0.264 mm., near posterior margin 0.32 mm.; prothorax length 0.22 mm., width not including coxae 0.50 mm.; mesothorax width 0.54 mm.; tube length 0.38 mm. Antennal segments length (width) I, 46 (46); II, 90 (46); III, 133 (50); IV, 106 (46); V, 106 (46); VI, 83 (43); VII, 90 (40); total 660 microns. Setae on posterior angles of prothorax 133, on ninth abdominal segment 280, at tip of tube 300 microns.

Head 1.7 longer than wide behind eyes but only 1.37 longer than width near posterior margin; cheeks smooth and straight; eyes longer on dorsal than on ventral surface; mandibles examined after dissection, pointed and grooved. Prothorax without median thickening, sutures complete. Fore wings with about 33 double fringe hairs.

Type material: Holotype female and three paratype females taken July 11, 1928 by Mr. A. F. Clark (No. 2954).

Type locality: Nelson, New Zealand.

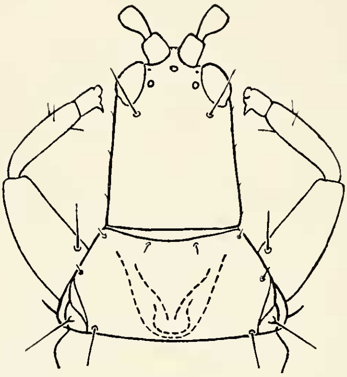


PLATE 2
Heptathrips tonnoiri Moulton.
Head and prothorax ♀.
Enlarged approxim. x 56.

ADROTHRIPS, new genus.

(Adros—stout.)

Genotype: *A. aureus,* new species.

Head slightly longer than wide, broadly angular in front, cheeks slightly and evenly arched, almost smooth; dorsum coarsely and indistinctly reticulate; postoculars wanting; eyes moderately large, joining cheeks evenly, dorsal and ventral lengths equal; ocelli small, anterior in position; antennae 8-segmented, 1.5 longer than head, 3 elongate connate and without sensecones, 4 and 5 elongate clavate the latter swollen and produced at tip on ventral side, 6-8 closely joined; mouthcone reaching two-thirds over prosternum, narrowed and pointed.

Prothorax longer than head, strong, with normal setae which are short and infundibuliform. Fore femora greatly enlarged, fore tibiae stout, each with a blunt, spine-bearing tubercle at tip within, fore tarsi stout, each armed with a strong tooth; middle and hind legs short and stocky; wings clear, without sign of venation, without double fringe hairs. Abdomen heavy, lateral setae with widely dilated tips; segments 2 to 7 each with two pairs of sigmoid setae, the anterior in each case smaller than the posterior pair. Tube 0.6 as long as head, of unique shape, at base being as wide as long, with sides abruptly constricted at the middle thence narrowing gradually to the rounded tip, the anterior and wider half with three or four irregular transverse rows of transparent pits.

The genus resembles *Dermothrips* Bagnall in the rather close union of the three distal segments of antennae but would seem to be more closely related to *Eucoenothrips* Bagnall in most characters. The unique shape of the tube sets it apart from other known genera.

ADROTHRIPS AUREUS, new species.

(Plate 3)

Holotype female: Clear light-brownish yellow with distal two-thirds of tube shaded orange to orange-brown, with a black

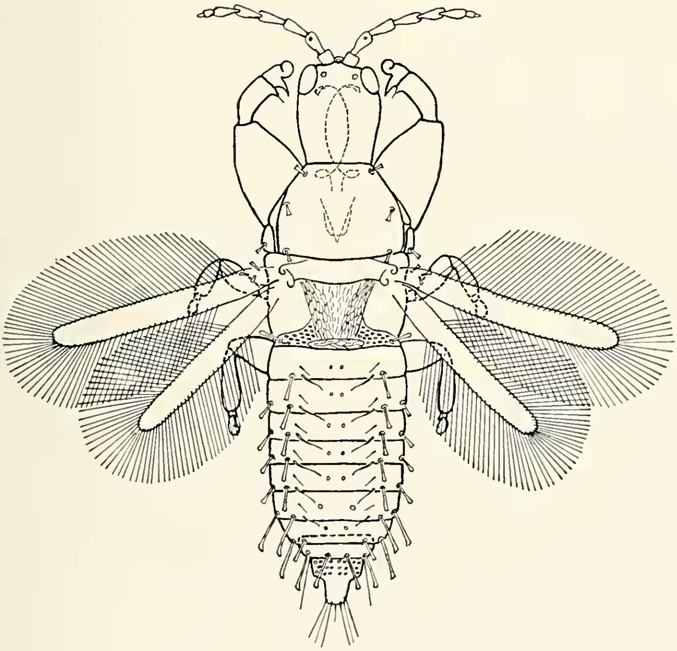


PLATE 3
Adrothrips aureus Moulton (♀).
Enlarged approxim. x 60.

spot on each tarsus, end of mouthcone black; antennal segments 1 to 4 clear yellow, 5 shading to light brown, 6-8 brown; wings and spines transparent.

Total body length 1.47 mm.; head length 0.260 mm., width 0.205 mm.; prothorax length 0.260 mm., width not including coxae 0.367 mm.; pterothorax width 0.352 mm.; abdomen width 0.396 mm., tube length 0.132 mm., width at base 0.132 mm., at end of broadened base 0.102 mm., at beginning of narrower distal half 0.073 mm., at end 0.044 mm. Antennal segments length (width) I, 33 (36); II, 56 (33); III, 60 (26); IV, 66 (30); V, 63 (26); VI, 53 (30); VII, 33 (22); VIII, 16, total 364 microns.

With the characters of the genus but especially to be noted are its short, stocky form, the golden yellow color, the absence of postocular setae, other normal setae short and with widely dilated tips. There are two pairs of pointed signoid setae on abdominal segments 2 to 7, the posterior pair on each segment being much stronger than the anterior pair. The shape of the tube, broad in basal half, narrowed in distal half and the basal part with transverse rows of pits are unique.

Type material: Holotype female and two paratype females taken on *Carmarina*, May 16, 1931 by Mr. S. E. Flanders (No. 4712).

Type locality: Ivanhoe, Australia.

SPILOTHRIPS, new genus.

(Spilos—speckled, referring to the varigated color.)

Genotype: *S. varicolor,* new species.

Head about as long as wide, almost semicircular in front to back of eyes, cheeks straight, almost parallel or slightly widened posteriorly; posterior part of dorsum indistinctly reticulate; postoculars wanting; eyes moderately large, subovate, joining cheeks evenly; ocelli large, anterior in position; antenna 8-segmented, 3 elongate connate, 5 and 6 with oblique tips, 7 and 8 closely joined, 3 with one sensecone; mouthcone short and broad, with rounded tip.

Prothorax more than twice wider than long, with a single short infundibuliform seta on each posterior angle and another on coxa, all other setae reduced. Fore legs enlarged, fore tarsus armed with a short, stout tooth, larger and stronger in male than in the female. Wings wanting. Abdomen elongate, increasing in size only slightly near the middle, reduced abruptly at segment 8, this with a noticeable swelling on either side. Tube 0.8 as long as head and about twice longer than basal width, with straight sides, slightly constricted at tip. In the male the abdomen is reduced gradually beyond the third segment. Two pairs of sigmoid setae on abdominal segments 2 to 7 are not especially strong.

This genus belongs in the short-headed, wingless group of the *Hoplothripini* Priesner and is most closely related to *Scopaeothrips* Hood. In this latter genus however the front of the head is produced between the eyes and separated from them by deep grooves also there are two pairs of infundibuliform setae behind the eyes, one pair on anterior angles and two pairs on posterior angles of prothorax. In this new genus the front of the head is broadly rounded, there are no setae on the head and only a single pair on the posterior angles of prothorax.

SPILOTHRIPS VARICOLOR Moulton, new species.

(Plate 4)

Holotype female: Light orange-yellow predominating; head darkened with brown especially around eyes, mesothorax likewise darkened at the sides with a lighter brown transverse connecting streak, second abdominal segment dark brown in anterior half, this band fades to light brown in the middle; abdominal segments 3 to 8 with a gray-brown spot on either side; tube abruptly orange in basal two-thirds, blackish brown in distal third; antennal segments 1 to 5 clear yellow with 5 darkened at tip, 6 lighter in basal half, 7 and 8 blackish brown; all setae clear to yellowish.

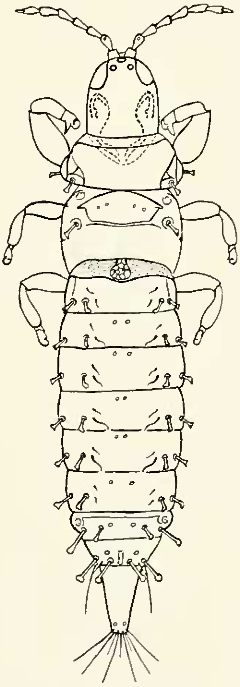


PLATE 4

Spilothrips varicolor Moulton (♀)

Enlarged approxim. x 52.

Total body length 1.75 mm.; head length 0.205 mm., width 0.205 mm.; prothorax length 0.150 mm., width including coxae 0.352 mm.; mesothorax width 0.323 mm.; width of abdomen at fourth segment 0.367 mm.; length of tube 0.16 mm., width at base 0.088 mm. Antennal segments length (width) I, 40 (36); II, 50 (33); III, 60 (30); IV, 53 (30); V, 43 (26); VI, 50 (24); VII and VIII 73, total 336 microns.

Type material: Holotype female, allotype male and one paratype female taken in blossoms of acacia in June, 1933 by G. W. Wickens. (No. 5561.)

Type locality: Bridgetown, West Australia.

BRITHOTHRIPS, new genus.

(Brithos—heavy, referring to the strong fore body structure.)

Genotype: *B. fuscus*, new species.

Head 1.5 longer than wide, broadly rounded in front, cheeks straight, roughened, emarginate behind eyes; postoculars wanting, cheek setae inconspicuous. Eyes subovate, slightly protruding; ocelli large, anterior in position; antenna 7-segmented, short, compact, not as long as head 3 subconical, 4-6 subglobose, pediculate; 7 small with an incomplete suture before extreme tip; 3 with one sensecone. Mouthcone short, rounded, extending about one-third over prosternum.

Thorax heavy, prothorax as long as head, pronotum somewhat shield-shaped, with incomplete median dorsal thickening; setae short, transparent, with widely dilated tips, one pair on anterior and two pairs on posterior angles; fore legs massive, fore tibiae and tarsi short and heavy, fore tarsus unarmed in female with a strong tooth in the male. Wings short, transparent, fringe hairs rather widely separated, fore pair with double fringes. Abdomen reduced gradually beyond second segment; tube .6 as long as head, twice longer than basal width, with almost straight sides; terminal hairs longer than tube.

This genus belongs in the gall-forming *Kladothrips* Froggatt group of the *Hoplothripini* but is distinctive because of the lack of armiture on the fore legs especially in the female. The antennal segments are similar in form to the wingless *Thaumatothrips* Karny. The genus may be compared with *Stegothrips* Hood, also with a 7-segmented antenna but the structure of the forebody is different.

BRITHOTHRIPS FUSCUS, new species.

(Plate 5)

Holotype female: Color uniformly yellowish brown, fore tibiae and tarsi also third antennal segment clear yellow; tube dark brown in median portion; wings and setae transparent.

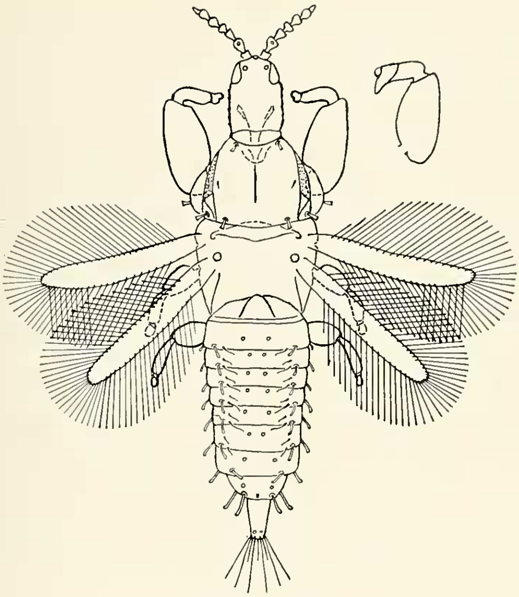


PLATE 5

Brithothrips fuscus Moulton (♀)
Upper right hand figure, right fore leg of ♂)
Enlarged approxim. x 47.

Total body length 1.68 mm.; head length 0.260 mm., width near middle 0.176 mm.; prothorax length 0.260 mm., width without coxae 0.382 mm., with coxae 0.470 mm.; pterothorax width 0.440 mm.; width of abdomen at second segment 0.396 mm.; length of tube 0.160 mm., width at base 0.080 mm. Antennal segments length (width): II, 43 (43); III, 40 (40); IV, 33 (40); V, 33 (40); VI, 40 (36); VII, 40 (26); total 250 microns.

With the characters of the genus. This species is distinctive because of the relatively heavy structure of the fore body, large but unarmed fore legs in the female, in the male with a strong tarsal tooth, the short, compact, 7-segmented antenna, lack of any prominent setae on head, the short, transparent setae on prothorax, these with widely dilated tips and the short transparent wings, the fore pair with six or seven double fringes. Sides of abdomen with short setae like those on the thorax also segments three to seven each with two pairs of sigmoid setae; terminal hairs longer than tube.

Type material: Holotype female and three paratype females taken in acacia galls in April, 1929 by Mr. R. J. Greenfield (No. 3526); allotype male taken on *Acacia oswaldi,* June 2, 1928 by Mr. W. W. Froggatt (No. 2951).

Type locality: South Australia.

Tribe PLECTROTHRIPINI Priesner.

DUNATOTHRIPS, new genus.

(Dunatos—powerful; referring to the powerful body structure.)

Genotype: *D. armatus,* new species.

Head almost spherical but constricted neck-like posteriorly; postoculars apparently wanting, cheeks with a few minute spines; eyes large, subovate, occupying two-fifths of the head's length, somewhat smaller on ventral side; ocelli moderately large; sense area on second antennal segment placed near middle, (antennae broken at second segment); mouthcone short, broadly rounded, reaching half over prosternum.

Thorax very strong and heavy, head and thorax longer than abdomen, pterothorax wider than abdomen; all normal setae on prothorax reduced except pair on posterior angles, these short, clear and with dilated tips, the inner pair smaller than the outer; fore legs exceedingly strong, fore femora with a horn-like projection on inside near base and a smaller process on inside at tip, inner tip of fore tibia with a similar process, fore tarsus with a stout tooth; intermediate and hind legs much smaller. Wings wanting. Abdomen short and compact, the first five segments of about equal width but noticeably narrower than pterothorax, segments 6 to 9 gradually reduced; tube slightly longer than basal width, with straight and parallel sides for about three-fifths its length, the distal two-fifths broadly rounded. Median dorsal setae on ninth segment as long or longer than tube, pair at angles more than twice longer, the third pair on ventral side reduced to short spurs; the two major dorsal setae at tip of tube are enlarged, black and curved pincer-like in basal half, these cross and curve S-shaped at about their middle, other terminal hairs are darkened but straight.

DUNATOTHRIPS ARMATUS, new species.

(Plate 6

Holotype (sex not determined): head and thorax brownish black, abdomen black; all femora, middle and hind tibiae nearly black, lighter only at joints, fore tibiae brown, darkened on outer margins; tarsi including the large teeth also the processes on fore femora clear yellow; antennal segments 1 and 2 black.

Total body length: 2.13 mm.; head length 0.338 mm., width 0.308 mm.; prothorax length 0.308 mm.. width including coxae 0.530 mm., without coxae 0.440 mm.; pterothorax length 0.514 mm., width 0.588 mm.; abdomen length including tube 1.0 mm., width near middle 0.558; tube length 0.117 mm., width at base and near middle 0.088 mm. Length of setae on posterior angles of prothorax 70, on coxae, 66, dorsal on ninth abdominal segment 173, ventral spurs 56 microns.

With the characters of the genus. This genus and species is especially characterized by its strong head and thorax, the noticeably smaller abdomen with its short, rounded tube and pincer-like and blackened setae at tip; also the absence of prominent setae on head and prothorax, except the posterior pair, and the enlarged and armed fore legs. Setae on the posterior angles of

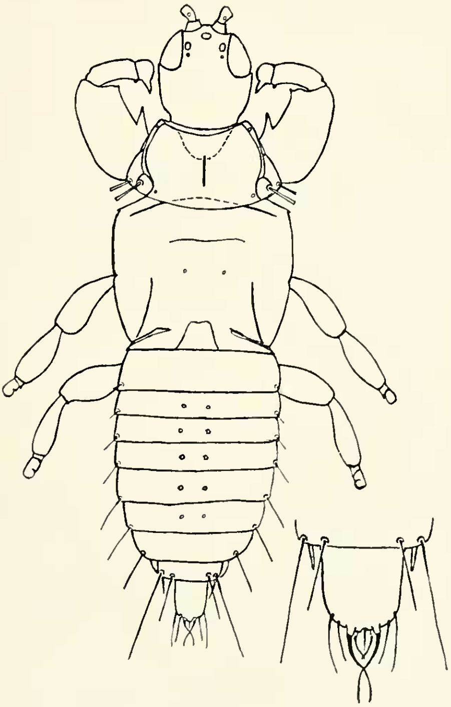


PLATE 6
Dunatothrips armatus Moulton (♂ ♀ ?)
(Lower right hand figure, tube of same)

abdominal segments are moderately short, clear to yellowish in color and have blunt to dilated tips.

Type material: One specimen, sex not determined because of intense black color, taken by Mr. A. M. Lea (No. 3112).

Type locality: Ooldea, Australia.

Subfamily MEGATHRIPINAE Priesner, 1927

Tribe COMPSOTHRIPINI Priesner, 1927

Emprosthiothrips, new genus.

(Emprosthios—fore, front, referring to the head projection.)

Genotype: *E. niger,* new species.

Head broadly produced in front of eyes, this process occupying approximately one-fourth the total length of the head and two-thirds as wide, measured from fore margins of eyes, the head length and width are about equal; cheeks parallel to near base where they are constricted neck-like, conspicuously roughened; head without postocular or other setae. Eyes joining cheeks evenly behind, narrowly produced on ventral side. Antenna 8-segmented, 2 broadest, conspicuously bent outward at pedicel, 3-6 broadly clavate, 7 and 8 closely joined, 3 with one sensecone. Mouthcone short and rounded.

Thorax reduced, prothorax explanate at sides, all normal setae wanting; pterothorax much shorter but slightly wider than prothorax. All legs small and without armiture. Wings wanting. Abdomen broadly ovate, without setae except extremely small ones on posterior angles of segments 8 and 9; tube slender, with straight sides, terminal hairs extremely short, approximately as long as width of tube.

Male somewhat smaller, legs similar and without armiture; without setae except a blunt-tipped pair on posterior angles of ninth abdominal segment, hairs at end of tube approximately twice longer than terminal width of tube.

Emprosthiothrips niger, new species.

(Plate 7)

Holotype female: Color jet black including legs and antennae except only pedicels of segments 3 and 4 which shade to brown.

Total body length 2.24 mm.; head length including process 0.352 mm., length of process from front margins of eyes 0.088

mm.; width of process 0.184 mm., width across cheeks 0.264 mm.; prothorax length 0.220 mm., width 0.426 mm.; width of abdomen at fourth segment 0.411 mm.; tube length 0.205 mm., width at base 0.088 mm.

Allotype male: Total length 2.12 mm.; width of process 0.147 mm., width across cheeks 0.227 mm., width of prothorax 0.308 mm., width of abdomen 0.441 mm. Antennal segments length (width) I, 33 (36); II, 82 (46); III, 80 (33); IV, 63 (36); V, 60 (36); VI, 53 (33); VII, 53, VIII, 26; total 430 microns.

This species is particularly characterized as noted in the generic description by the broadly produced head, the stout and bent second antennal segment, with sense area near tip, segment 3 with one sensecone and segments 7 and 8 closely joined, the small and unarmed legs, explanate prothorax, the absence of wings and the absence of all normally developed body setae.

Type material: Holotype female (No. 3142), and allotype male (No. 3108) taken by Mr. A. M. Lea.

Type locality: Lucindale, South Australia.

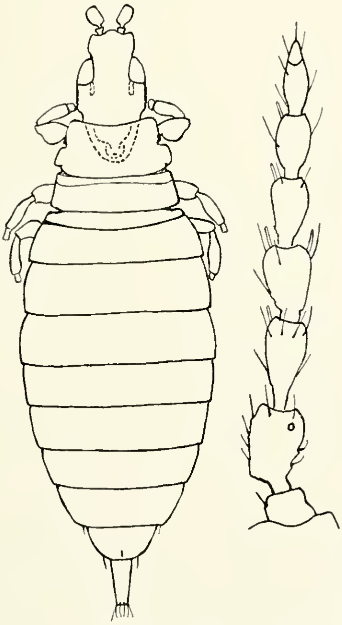


PLATE 7

Emprosthiothrips niger Moulton (♀)

(Right hand figure, right antenna of ♂)